

Chordata and Vertebrata

Characters of Class Pisces (fishes):

1. The class of fishes is called Pisces. They are aquatic vertebrates.
2. According to their size and shape, the fishes are of many kinds.
3. They have a head, a trunk and a tail.
4. The head and trunk are directly jointed together and neck absent.
5. Body of fish is flexible tapering at both ends and streamlined. This type of body helps in swimming.
6. They can swim with fins, which are attached to the trunk.
7. Their body is covered with scales which remain moist by special type of secretion of body.
8. Breathing organs are gills which are present in the hollow spaces found on both sides of the head for exchange of gases i.e. oxygen and carbon dioxide.
9. Mouth has teeth, which is used for grasping instead of grinding of food.
10. In some fishes air pouch is present, which is called air bladder. The air bladder is used for buoyancy.

Class Amphibia:

1. This group of animals can live both in water and on land.
2. They need water for reproduction. Therefore they are called Amphibians.
3. The skin is thin, moist and slimy.
4. Small teeth are present in the upper jaw which is only used for grasping the prey.
5. Breathing organs are two lungs. Skin is also used for the exchange of gases.
6. Eggs are laid in water or moist places and their outer shells are not hard.
7. They are cold blooded animals e.g. they cannot maintain their body temperature constant.

8. They become very slow and bury themselves in the mud. This process is called hibernation.
9. During the process of reproduction fertilized egg is changed into adult passing through a number of physical changes. This process is called metamorphosis.
10. The fertilized egg develops into larva. The larva of frog is called Tadpole. It has tail and gills. This larva later changes into adult.

Class Reptilia:

The animals of this class are called reptiles. They have following features.

Reptiles

1. Most of the reptiles are terrestrial and only a few live in water.
2. They are also called crawlers.
3. They have thick, dry and rough skin.
4. The skin is covered with scales which originate from the ectoderm.
5. There are present lungs for respiration.
6. Teeth are present in their buccal cavity, which are used for cutting and biting.
7. The locomotory organs are legs but snakes and a few types of lizards have no legs.
8. Most of the lizards are not poisonous except members of the genus *Heloderma* which are found in American desert.
9. All the reptiles lay their eggs on land. Water dwelling reptiles e.g. turtle also lay their eggs on land.
10. Their eggs have a tough outer shell of calcium carbonate.

Class Aves:

The animals included in this class are called Birds. Their distinguishing characters are as follows.

1. Birds have a single unique feature, which makes them different from other animals which is the presence of feathers. Their forelimbs are modified to form wings while hind limbs help in walking, wading and sitting on the branches.
2. All the birds have horny beaks without teeth.
3. All the birds lay eggs.
4. All the birds must have two wings for support and propulsion, strong but light and hollow bones.
5. Their digestive system is able to digest high caloric food.
6. They have a higher blood pressure and higher metabolic rate.
7. Nervous system and especially eye sight is very well developed so that they can track their path even at a very high speed.
8. They migrate during winters towards warmer places covering thousands of miles.
9. It is the most studied and most observable class in the world.
10. The birds are very beautiful and have melodious voices.

Types or Groups of Birds:

Running Birds (Ratitae)

They have following characters:

1. They have flattened sternum.
2. Their pectoral muscles are weak.
3. Their examples are Ostrich, Emu, Rhea and Cassowary.

Flying Birds (Carinatae)

They have following characters:

1. A keel is present on sternum in these birds.

2. Keel is vertical bony part that is present below the sternum in the centre from anterior to posterior end.
3. Pectoral muscles are very strong, powerful and are inserted on the keel. These muscles help them to fly.
4. Their common examples are pigeon, hen, crow, kite etc.

Class Mammalia:

All the animals included in this class are called "mammals". These animals are highly advanced vertebrates. There are almost four thousand species of mammals including man.

Characteristics of Mammals

Their distinguishing characters are given below:

Hair

The body of mammals is covered with hair. In most of the mammals hair may cover the whole body but in a few may be restricted to some areas. The hair conserves heat of the body.

Glands

Their skin is provided with sweat glands, scent glands, sebaceous glands and mammary glands.

Skeleton

Two occipital condyles, secondary bony palate, three bones in middle ear and fused pelvic bones and seven cervical vertebrae are present in their skeleton.

External Ear

Fleshy external ears are present in mammals.

Eyelids

Moveable eyelids are present in mammals.

Teeth

Two sets of teeth are present. Milk teeth are replaced by permanent set of teeth.

Brain

Brain is highly developed. It performs more functions than that of other vertebrates.

Cranial Nerves

Twelve pairs of cranial nerves are present.

Circulatory System

Circulatory system has four-chambered heart, persistent left aorta and non-nucleated biconcave red blood corpuscles are present in female.

Sexes

Sexes are separate i.e. there are two individuals, male and female.

Fertilization

Most of them have internal fertilization and fetus developed inside the uterus of female giving birth to their children.

Breast Feeding

They feed the children by milk from mammary glands.

Endothermic

They are endothermic i.e. they can maintain their body temperature according to the environment. It means that they are warm-blooded animals.

Egg Laying Mammals:

These mammals lay eggs. Mostly two eggs are laid in one year. Fertilization of egg is internal i.e. inside the body of mother. Eggs are laid in burrows of animals. Young ones are hatched from the eggs. Mother feeds their children with milk. Their egg-laying character shows their

relationship with reptiles. Duck bill platypus and Spiny ant eater are the examples of egg laying mammals.

Pouched Mammals or Marsupial Mammals:

These mammals have a pouch outside the belly called marsupium, this is the reason that they are also known as Marsupial mammals.

1. Fertilization of eggs and development of embryo is internal.
2. The embryo is at first encapsulated by shell membrane and floats free for several days in the uterine fluid.
3. There is no placenta.
4. After hatching from the shell membranes, the embryo does not implant or "take root" in the uterus and absorb nutrient secretions from the vascularized yolk sac.
5. The gestation period is brief and the marsupials give birth to tiny young that is effectively still an embryo.
6. These young creeps into the marsupium where it gets milk from mother through nipple.
7. It lives in marsupium until it can take care of itself.
8. Examples are Kangaroo, Koala, Tasmanian wolf and Wombat etc. These are found in Australia and Tasmania, Opossum is found in America. It lives on trees.

Placental Mammals:

This is common group of mammals in which embryo completes its development inside the mother's uterus. After gestation period young ones are born. Embryo remains in the uterus and gets its nourishment from mother through umbilical cord and placenta. Gestation period of these mammals is longer than those of other mammals. Pregnancy is called Gestation Period. In man it is of 9th months.

In mice it is 21 days, in rabbit 30 to 36 days, in cats and dogs 60 days, in cattle 250 days and in elephants 22 months. It is lengthier in large mammals.

The conditions of young ones at time of birth are different in different mammals. For example in antelope, at the time of birth, the body of young is covered over, with heavy fur, eyes are open

and it can walk about. In case of rat, young is very weak, eyes are closed and has no hair on the body.

Flora and Fauna of Pakistan:

Flora:

Definition

"Different types of plants present in a particular region constitute its flora."

Details

1. Hilly regions of Pakistan have snow fall and low temperature. These regions have thick forests where trees of Juniper (Sanobar), Cedar, Chir, Chalkhoza, Olive Apple, Plum Peach and Loquat are very common.
2. Plain areas of Pakistan have fertile and less fertile soils. In areas where rainfall is low, desert environment is present in which Acacia (Babool), Kikar, Ber, Pals etc grow.
3. Fertile plains have trees of Sheesham, Bakain, Cane, Bamboo and Eucalyptus. These are source of timber whereas; fruit trees include mango, banana, Kino, Orange, Grapes, Jamman etc.
4. Plain and hilly areas have natural pasture lands that provide fodder for cattle.
5. In sea, rivers, ponds, canals and streams, algae are abundant, which on one hand are the source of food for aquatic animals and on the other hand they provide oxygen to atmosphere.
6. A large number of plants are used as ornamental plants. These include flowering plants like rose, motia, jasmine, lady of night, chrysanthemum etc.
7. Besides this wheat, maize, rice, oats, barley, grams garlic, onion, potatoes, carrots, cabbage and turnips etc are cultivated in plains and hilly areas to meet our food requirements.

Fauna:

Definition

"Different kinds of animals present in a particular region are known as its Fauna."

Details

1. In the seas adjoining our coastal areas numerous types of animals are found starting from protozoa to mammals. The most noticeable are octopus, mussels, star fish, sea urchins, crabs, prawns, fishes, amphibians, whale, dolphin etc.
2. Many animals are used as food e.g. prawns, crabs and fish etc. Our rivers are rich in fish life particularly Rohu, Khagga, Malhi, Trout, and carps are abundant and used as human food, as well as a source of earning lively hood.
3. Frogs and toads are abundant.
4. The tortoises, turtles, snakes, crocodiles are also common.
5. On the plains of Pakistan we have very rich wild life. There is a great diversity of land fauna starting from earthworms, almost all kinds of insects, spiders, myriapods, snails, slugs to toads, lizards, snakes and enormous variety of birds and mammals.
6. Some of the birds peculiar to Pakistan are Houbara bustard, partridge, pheasant, falcons etc.
7. The mammals peculiar to Pakistan include Black buck, Blue ball, Brown bear, Musk deer, Urial, Ibex, Asiatic ass.etc.
8. Most of the animals provide milk, meat, hide and wool. Some are used for transportation. Some of the animals are now endemgered species because of their excessive hunting and pollution.

Warm Blooded Animals:

The animals which do not change their body temperature with the change of temperature in environment are called as Warm Blooded Animals. Their body temperature remains constant.

Example

Common examples of warm blooded animals are following.

- (i) Parrot
- (ii) Sparrow
- (iii) Pigeon
- (iv) Ostrich
- (v) Kiwi

(vi) Duck billed platypus

(vii) Kangaro

(viii) Opposum

(ix) Elephant

(x) Whale

(xi) Monkey

(xii) Man

Cood Blooded Animals:

The animals in which the body temperature is changed with the changes of temperature in the environment are called Cold Blooded Animals.

Example

Common example of cold blooded animals are following.

(i) Shark

(ii) Labeo (Rohu)

(iii) Trout

(iv) Hilsa (Pullah Fish)

(v) Cat Fish (Khagga)

(vi) Frog

(vii) Toad

(viii) Snake

(ix) Wall-Lizard

(x) Crocodile